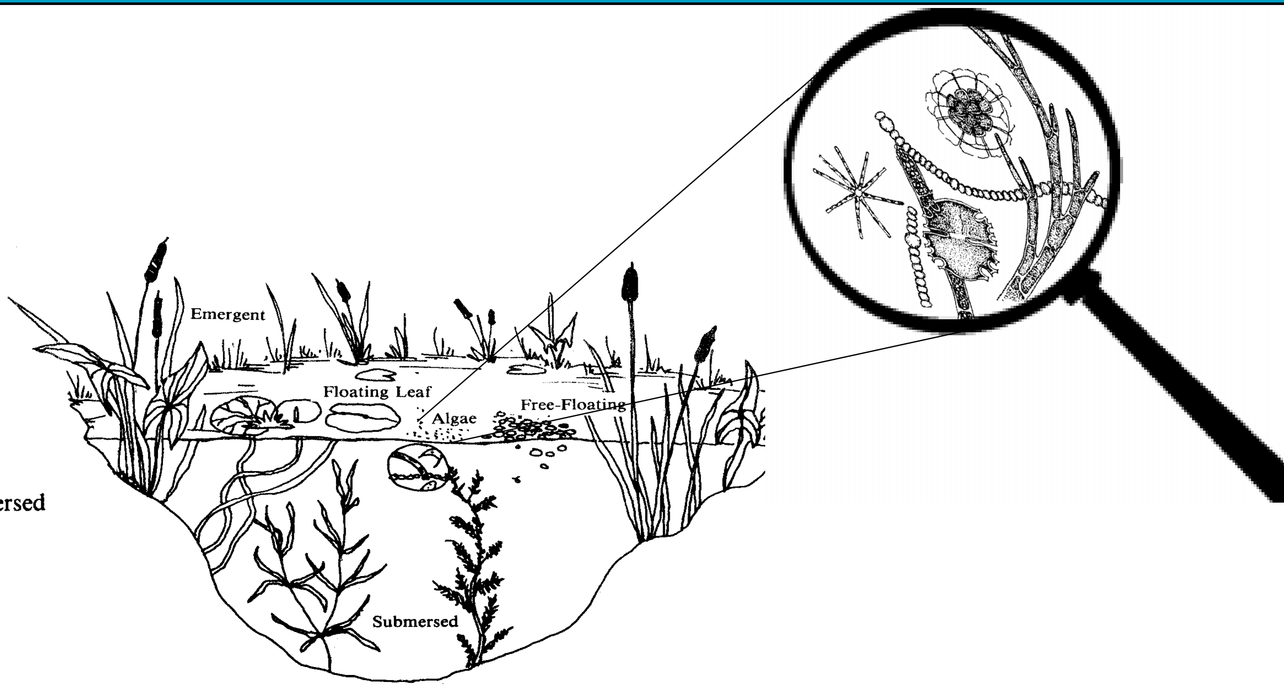
AQUAGUIDE

MISSOURI DEPARTMENT OF CONSERVATION

Algae Control in Lakes and Ponds

chara



Aquatic plants are a beneficial and necessary part of Missouri ponds and lakes. Without them, most other pond organisms cannot survive. Plants keep the water oxygenated, provide food, cover and nesting sites for fish, and stabilize the shoreline and pond bottom. In a healthy pond, 10 to 20 percent of the pond's bottom and surface should have aquatic plants. If more than 20 percent of the pond has plants or if the vegetation is causing a problem, a control method should be considered.

What are Algae?

Algae are primitive aquatic plants common to virtually all Missouri waters. These simple plants differ from other plants by lacking true stems, leaves or roots. Algae are a basic component of a complex aquatic food web, converting the sun's energy into a form useful to other aquatic life. Algae are also a primary source of dissolved oxygen, which is a byproduct of their energy production.

Algae occur in three basic forms: planktonic, filamentous and macrophytic.

Planktonic algae are single-celled, microscopic plants that float freely in the water. When these plants are extremely abundant or "bloom," they make the pond water turn green. Less often, they can turn the water other colors, including yellow, gray, brown or red.

Filamentous algae are sometimes referred to as "pond moss" or "pond scum." Filamentous algae occur as fine green threads that form floating mats, which are often moved around the pond by wind. This type of algae is also commonly found attached to rocks, submerged trees, other aquatic plants and boatdocks.

Macrophytic algae resemble true plants in that they appear to have stems and leaves, and are attached to the bottom. The most commonly occurring macrophytic algae in Missouri is called Chara or musk grass (due to its strong musky odor.) Chara feels coarse to the touch, because of lime (calcium carbonate) deposits on its surface, earning it another common name—stonewort.

Refer to our publication entitled, “Nuisance Aquatic Plants in Missouri Ponds and Lakes” for more information on the identification of aquatic vegetation, and the benefits and drawbacks of having aquatic plants in your pond.

Algae Problems

Like many things that benefit us, too much algae can prove a drawback. Taste and odor problems in drinking water and sometimes even fish kills are associated with excessive blooms of planktonic algae. Filamentous algae and macrophytic algae often form dense growths that make fishing, swimming and other recreational uses nearly impossible. Total coverage can restrict sunlight penetration and limit the production of oxygen and food items necessary for good fish growth. When algae abundance interferes with the intended use of the pond, a control method should be considered.

Algae Control

Algae problems are usually caused by an overabundance of nutrients (nitrogen and phosphorous) in the pond. From the moment a pond is built, it becomes a settling basin for nutrients washing in from the land that drains into it (the pond’s watershed). The older a pond gets, the more nutrients it has accumulated and the more susceptible it is to algae problems.

Runoff from fertilized fields, lawns and pastures, or from feedlots, septic tanks and leach fields accelerates nutrient loading and algae growth in the pond. If the pond is old and has become shallow due to accumulation of black muck on the bottom, it may be necessary to drain, dry and deepen the pond. Excavated material should be removed from the pond’s watershed.

Planning

Establishing and maintaining a 100 foot or wider buffer strip of grass and trees around the pond’s edge will help filter excess nutrients from runoff water. This combined with a 3:1 grade at the shoreline will reduce the opportunities for macrophytic algae and other rooted plants to grow to nuisance levels in the lake.

The construction of small (4-6feet in depth) silt retention ponds in the watershed will help settle out nutrients before they can enter the lake.

Localized nutrient inputs from feedlots or other sources may be avoided by tiling, or by constructing a water diversion terrace below the nutrient source to direct its runoff away from the pond. Fencing livestock from the pond’s edge and watering them from a tank below the dam is also a helpful protective measure. The Natural Resource Conservation Service (NRCS) office in your area can provide information on these and other water quality practices.

Mechanical Control

Mechanical control means removing the vegetation by hand. Mats of filamentous algae may be removed with a rake, seine, screen wire or similar devices; however, this control method is very labor intensive and provides only temporary control. In some instances, the algae may seem to grow as fast as it is pulled out. Mechanical control is practical when used in conjunction with chemical control methods or as a maintenance treatment around swimming or fishing areas for an occasional special event.

Algae removed from the pond by mechanical means should be deposited below the pond’s dam to ensure that nutrients tied up in the vegetation do not re-enter the pond.

Biological Control

Biological control means stocking grass carp (Ctenopharyngodon idella) to control aquatic vegetation. Grass carp are not very effective at controlling filamentous or macrophytic algae, except at very high densities. Grass carp do not control planktonic algae.

SPORT FISH RESTORATION

Partial funding provided by Federal Aid in Sport Fish Restoration

Chemical Control

DIRECTIONS, RESTRICTIONS AND WARNINGS

ALWAYS READ THE PRODUCT LABEL FOR DIRECTIONS, CURRENT RESTRICTIONS AND WARNINGS. Before using chemicals, you should consider potential contamination of domestic water supplies and the waiting periods for watering livestock, eating fish, swimming and irrigation. Algae control with chemicals works best when the water temperature is above 60° Fahrenheit and algae mats are broken up while the chemical is being applied.

To avoid oxygen depletion and a possible fish kill, avoid treating when the water temperature is above 80° Fahrenheit and <u>treat only 1/4 to 1/3 of the vegetation at a time</u>. Allow ten days to two weeks between consecutive treatments. Chemicals do not provide permanent control, so repeated treatments are usually necessary to keep algae at desired levels. Please remember that the long term effects of most herbicides on the environment are not well known.

Currently recommended herbicides for algae control and their suggested retail prices. Though these chemicals are reccommended by MDC personnel and have proven reliable other chemicals may be suitable for aquatic weed control.

	Cutrine Plus (Liquid)	Cutrine Plus (Granular)	Copper Sulfate
Planktonic Algae	approved	approved	approved
Filamentous Algae	approved	approved	approved
Macrophytic Algae	approved	approved	approved
Minimum Quantity Available	1 gallon	10 lbs	1lb.
Approx. price per unit	$30.00	$23.15	$0.80

Local farm supply stores often carry, or will order, these herbicides. For alternate sources of chemicals, a copy of the product's label, or clarification of this Aquaguide, contact your Fisheries Regional office or the MDC web-site at www.conservation.state.mo.us. Other Aquaguides on aquatic weed control are also available.

KR-4/96
revised RLN-1/99
FIS 090

Determination of Acre-Feet to Calculate Total Amount of Herbicide Needed

If the acreage of the area to be treated is known, the number of acre-feet can be determined by multiplying the number of acres by the average depth (average depth = 1/3 of the maximum depth). For example: A two acre area is to be treated and has an average depth of three feet. The volume of the water is six acre-feet.

2 acres x 3 feet (average depth) = 6 acre-feet

If the dosage of herbicide recommended is 2 gallons of herbicide per acre-foot, the total herbicide needed would be twelve gallons.

6 acre-feet x 2 gal/acre-foot = 12 gallons (total herbicide needed)

If the number of acres is not known, it can be estimated by measuring the number of square feet and dividing by 43,560. The number of square feet in many cases can be closely approximated by multiplying the average width in feet by the average length in feet. For example: A shoreline area is to be treated. The weeded area is 500 feet long and averages 10 feet wide. The total surface area is 5,000 square feet or 0.115 acres.

10 feet x 500 feet = 5,000 square feet

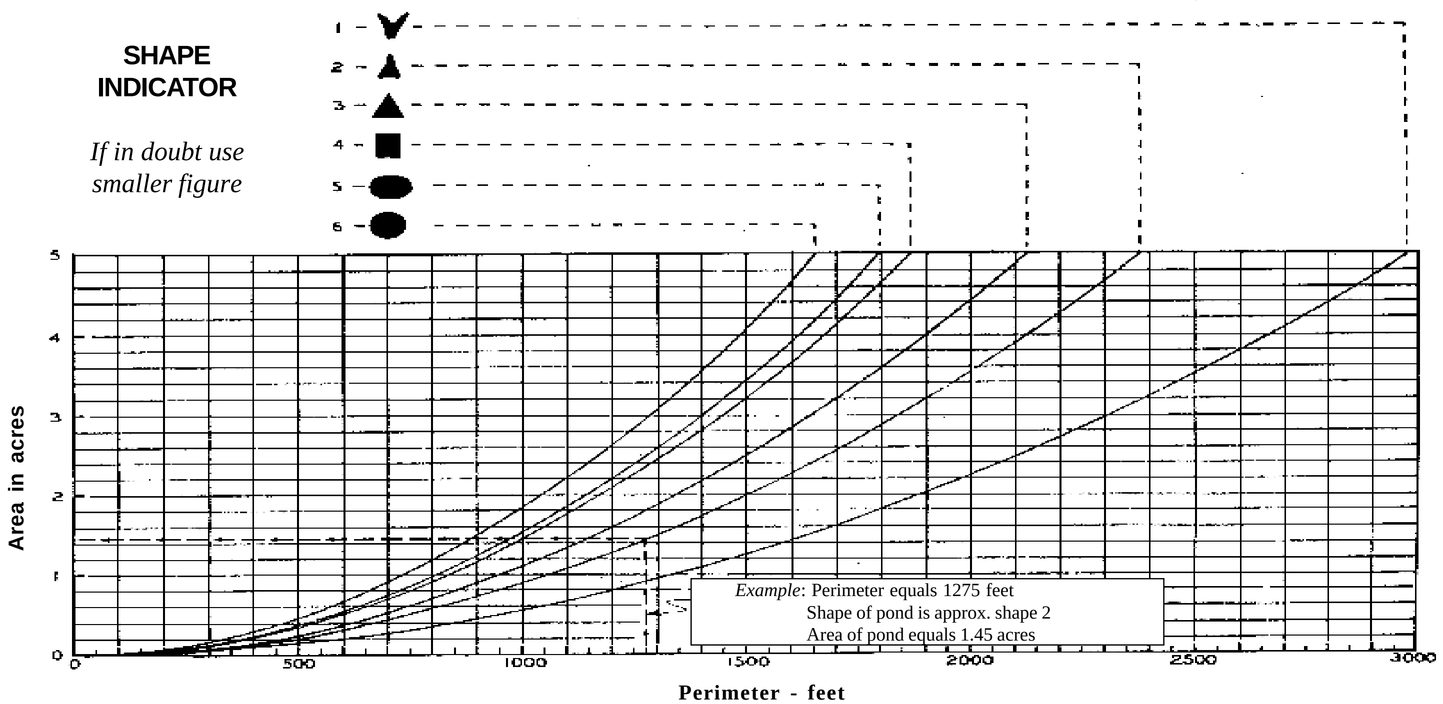
$$\frac{\textbf{5,000 square feet}}{\textbf{43,560 (square feet in an acre)}} = \textbf{0.115 acres}$$

The average depth of water in this shoreline area is 1 foot. The total acre-feet is 0.115.

0.115 acres x 1 foot (average depth) = 0.115 acre-feet

If we assume that 4 gal/acre-foot was the recommended dosage, then 0.46 gallons of herbicide would be needed.

4 gal/acre-foot x 0.115 (acre feet) = 0.46 gallons (total herbicide needed)



POND AREA ESTIMATOR